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R. CHOWNE'S "air-syphon" system of ventilation, mentioned by us in some previous numbers of this journal, has excited the curiosity of many of our readers,

who appear to expect from us a fuller development of its nature. The importance of an efficient, cheap, and simple method of ventilation cannot be over-rated, and claims for every scientific and honest endeavour to provide it the fullest protection, careful and candid consideration, and the most liberal encouragement.

In the specification of his patent, Dr. Chowne sets it forth as follows:—

"My invention consists of applying a principle which I have found to prevail in the atmosphere of moving up the longer leg of a syphon and of entering and descending in the shorter leg, and this without the necessity for the application of artificial heat to the longer leg of a syphon. And in order that my invention may be most fully understood, and readily carried into effect, I will proceed to describe the means pursued by me; and in doing so I will, in the first place, enter more at large into the principle on which the invention is based.

"I have found that if a bent tube or hollow passage be fixed with the legs upwards, the legs being of unequal lengths, whether it be in the open air or with the shorter leg communicating with a room or other place, that the air circulates up the longer leg, and it enters and moves down the shorter leg, and that this action is not prevented by making the shorter leg hot whilst the longer leg remains cold, and no artificial heat is necessary to the longer leg of the air-syphon to cause this action to take place; thus is the direction of the action of air in a syphon the reverse of that which takes place in a syphon, or like bent passage or tube, when used for water and other liquid, wherein the water or other liquid enters and rises up in the shorter leg and descends or moves down in the longer leg. And my invention consists of applying this principle when ventilating rooms or apartments, such as those of a house or ship, or other building or place."

He then goes on to describe the invention as applied to the rooms of a house where there are chimneys opening into such rooms, and says, in these cases "I employ the chimney as the longer leg of the air-syphon, which I arrange in order to ventilate a room, and I am enabled to use the chimney whether for the time being there is or is not a fire lighted in the fireplace of the room; but I prefer, when there is no lighted fire, that the fireplace should be closed either by a register stove being shut, if one be used, or if not, by a close oblinney-board, or by other convenient means, and I form a passage or channel either when constructing the building, or by cutting away if not previously constructed, or I otherwise form such channel or passage, or more than one, from the upper part of the room or near the ceiling of the room, and cause it to descend and to enter the chimney at a point above the top of the fireplace, when it is an open fireplace, and it may be lower down when closed; and in order that the whole of

the upper part of the room may be in communication with such descending passage or channel leading to the chimney, I form a hollow cornice sufficiently open to allow of the atmosphere at or near the upper part of the room to flow into the same, and owing to the atmospheric syphon which will thus be formed, there will be a constant flow of the air in a direction from the upper part of the room down the descending channel or passage, which will represent the shorter leg, and thence into the chimney and away up the chimney, which will constitute the longer leg of the air-syphon."

When fixed gas-burners or lamps are used, then he prefers that a tube or hollow passage should be conducted down to form the shorter leg of the air-syphon, in any convenient direction, and be caused to enter the chimney as before described, or such channel or passage may be of metal or other material projecting from the walls of the buildings, or it may be down pillars or channels independent of the walls, where the architecture or ornamental portion of the walls or other parts will admit of it; and, so far from its being necessary that there should be any bell over the chimney of a gas-burner or other lamp, the patentee has found that having, close to the top of the glass chimney, a lateral tube opening into the shorter leg of the syphon, is by far the most effectual way of getting rid of the heated air from the lights: the products, in place of rising up and becoming diffused in the room, pass rapidly through the lateral tube into the shorter leg of the syphon. Of this, however, we will speak again presently.

At the risk of repetition, we will mention something of what we have seen at the patentee's residence, in illustration of the principle involved. At the back of his house the Doctor has fixed a small zinc pipe, running from the level of the ground to over the roof of the house, and turning up at the bottom three or four feet, to form a syphon. The smoke of burnt paper, brought near to the mouth of this short end, gave evidence, by its rapid descent, of the current through the pipe. When the bend of the syphon, next the ground, was made to extend the whole length of the garden, and there to turn up the three or four feet as before, the action was the same, and so it was when a jacket of hot water was placed around the short arm of the pipe.

This arrangement is in the open air, it must be remembered; and the patentee states that in all seasons and at all times,—in the middle of a July day with a hot sun on the pipe, or at midnight in December when it is cased with ice,—the current is always the same, with the exception only that sudden gusts of wind will occasionally cause a partial return of it.

In the room wherein the patentee has carried on his experiments, filled with tortured and convulsed pipes, and as many gas-lights as would illuminate a chapel, we were able to see the practical application of the simple fact established by the pipe outside. Here the chimney formed the long leg of the syphon, a chimney-board filled the opening of the fireplace (there being no fire in the grate), and the shorter legs of the syphon (for there were several, all connected with the one longer leg, either through the chimney-board or by an opening above the register direct into the flue), consisted of pipes brought from different parts of the room. The mouth of one pipe opened close under the ceiling, the mouth of another half way up the height of the room, but

through each equally there the current was made manifest when the smoke of burnt paper was applied. Some seats around the room had a rude channel formed beneath them by means of stout paper, which was loosely connected, at one extremity, with an upright open-mouthed tube in an angle of the room, about the height of a man, and at the other, equally slightly, with the chimney. The force of the current produced was extraordinary.

It is scarcely necessary to point out the means thus afforded for ventilating large assemblies. Busts on pedestals might be made to contain pipes, or the pipes might be let into the walls and partitions. In sick rooms a flexible tube might be suspended over the person and bed, and then be conducted in such a manner as to descend and enter a chimney, which would produce a constant flow of the atmosphere of the room through the tube, and so away.

A supply of fresh air, to take the place of the vitiated air removed, must be provided, but this does not enter into the present patent. The doctor seems to content himself "with the pure air, which is constantly flowing into the room by the door or other openings,"—but this is an insubstantial and inefficient mode of supply, which should not be depended on under other than very ordinary circumstances.

A second syphon, perhaps, might be usefully employed, having the short end outside the house, and the opening of the long end near the ceiling of the apartment within, thus reversing the action, and bringing in fresh air in such a manner that it might be spread throughout the room without producing draughts.

The patentee further proposes to apply his system to ventilate the goaf of a mine:—"In such a case," he says, "one or more pipes, or channels, being laid therein, and carried as high up as possible, the other end of such passage is to be carried up one of the shafts of the mine to the surface of the earth, and opened into a chimney, which would become the longer leg of the atmospheric syphon, by which arrangement the gases and atmosphere of the goaf, in place of from time to time getting into the mine, would be constantly carried away. And if desired, the whole of the mine may be ventilated in this manner, for in place of having a furnace in the upcast shaft, as now practised, it will be only necessary to raise a tall chimney over the upcast shaft, so that the downcast shaft and the mine below shall be made the shorter leg of the atmospheric syphon, and the chimney and upcast shaft the longer leg of the syphon, and thus a constant ventilation will go on."

And now as to the gas-lights: we consider the establishment by Dr. Chowne of the fact that to take away the heat and deleterious products of combustion the opening should be not over, but close to and forming a right angle with the top of the glass chimney, one of the most valuable results of his experiments. In the room to which we have referred there is an upright hollow pillar communicating at the bottom with the chimney, and bearing around the upper part of it a number of gas-burners. Just above each glass chimney is a short tube about 2 inches diameter, projecting laterally from the hollow pillar into which it opens, and just touching the lip of the glass. A thermometer was suspended within the pillar, and on lighting the gas this rose in a very few minutes from 65 deg. to 100 deg., while the apartment remained cool. The effect of the lateral tube is made evident in this,—that